AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (Currently Amended): An extrudable resin composition, comprising:

a high temperature engineering thermoplastic compounded with an external lubricant and one or more of a reinforcement component, an enhancing filler component, and a polymeric lubricant, ~~and an external lubricant,~~ wherein the extrudable resin composition is thermally stable at temperatures of up to about 427°C; wherein the high temperature engineering thermoplastic is one or more selected from the group consisting of polyarylketones, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), polyolefins, and polyarylene sulfides; and the external lubricant is one or more selected from the group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes.

Claim 2 (Original): The composition of claim 1, wherein the high temperature engineering thermoplastic is present in the extrudable resin composition at a level between about 50 to 99.9 wt. %.

Claim 3 (Original): The composition of claim 1, wherein the reinforcement component is present in the extrudable resin composition at a level between about 0.1 to 40 wt. %.

Claim 4 (Original): The composition of claim 1, wherein the enhancing filler component is present in the extrudable resin composition at a level between about 0.01 to 10 wt. %.

Claim 5 (Original): The composition of claim 1, wherein the polymeric lubricant is present in the extrudable resin composition at a level between about 0.001 to 5 wt. %.

Claim 6 (Original): The composition of claim 1, wherein the external lubricant is present in the extrudable resin composition at a level between about 0.001 to 2 wt. %.

Claim 7 (Currently Amended): The composition of claim 1, wherein the high temperature engineering thermoplastic is one or more ~~selected from the group consisting of~~ polyarylketones~~, polyarylene sulfides, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), and polyolefins~~ selected from the group consisting of: polyether ether ketones (PEEK), polyether ketones (PEK), and polyether ketone ketones (PEKK).

Claim 8 (Currently Amended): The composition of ~~claim 7~~ claim 1, wherein the polyarylene sulfide comprises polyphenylene sulfide (PPS).

Claim 9 (Original): The composition of claim 7, wherein the polyarylketone comprises polyether ether ketones (PEEK).

Claim 10 (Original) The composition of claim 7, wherein the polyarylketone comprises polyether ketones (PEK).

Claim 11 (Original): The composition of claim 7, wherein the polyarylketone comprises polyether ketone ketones (PEKK).

Claim 12 (Original): The composition of claim 7, wherein the polyarylketone has a melt index (MI) up to about 200 g/10 min. measured at 204°C and 8.4Kg.

Claim 13 (Original): The composition of claim 8, wherein the polyphenylene sulfide has an MI up to about 200 g/10 min. measured at 320°C and 3.7Kg.

Claim 14 (Original): The composition of claim 7, wherein the polyarylketone, has a 6 minute to 30 minute (6/30) MI ratio of between about 0.1 to 1.

Claim 15 (Original): The composition of claim 14, wherein the 6/30 MI ratio is close to 1.

Claim 16 (Original): The composition of claim 8, wherein the polyphenylene sulfide has a 6 minute to 15 minute (6/15) MI ratio of between about 0.1 to 1.

Claim 17 (Original): The composition of claim 16, wherein the 6/15 ratio is close to 1.

Claim 18 (Original): The composition of claim 3, wherein the reinforcement component is one or more selected from inorganic fibers, glass fibers, carbon fibers, graphite, ceramic fibers, and polymeric fibers.

Claim 19 (Original): The composition of claim 18, wherein the inorganic fiber is glass fiber.

Claim 20 (Original): The composition of claim 4, wherein the enhancing filler component is one or more selected from titanium dioxide, barium sulfate, silica, alumina, talc, mica, kaolin, clay, silica-alumina, calcium carbonate, calcium silicate, calcium phosphate, calcium sulfate, magnesium carbonate, magnesium oxide, zinc oxide, magnesium phosphate, silicon nitride, glass, hydrotalcite, and zirconium oxide.

Claim 21 (Original): The composition of claim 20, wherein the enhancing filler component is a mineral oxide present between about 15 to 25 wt. %.

Claim 22 (Original): The composition of claim 5, wherein the polymeric lubricant is a fluoropolymer.

Claim 23 (Original): The composition of claim 22, wherein the fluoropolymer is a polymer comprising one or more monomers selected from the group consisting of tetrafluoroethylene, trifluoroethylene, vinylidene fluoride, chlorotrifluoroethylene, and fluorinated alkyl esters of (meth) acrylic acid.

Claim 24 (Currently Amended): The composition of claim 6, wherein the external lubricant is ~~one or more selected from the group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes~~ present in the extrudable resin composition at a level between about 0.01 to 1.9 wt. %.

Claim 25 (Currently Amended): The composition of ~~claim 24~~ claim 1, wherein the fatty acids include one or more selected from the group consisting of myristic acid, palmitic acid, stearic acid, arachic acid, montanic acid, octadecenoic acid, and parinaric acid.

Claim 26 (Currently Amended): The composition of ~~claim 24~~ claim 1, wherein the fatty acid esters are selected from fatty acids esterified with one or more hydroxyl containing compounds selected from the group consisting of glycerol, ethylene glycol, propylene glycol, pentaerythritol and C_1 to C_{24} alkylols.

Claim 27 (Currently Amended): The composition of ~~claim 24~~ claim 1, wherein the fatty acid amides are selected from fatty acids that have undergone an amidation reaction with one or more amine containing compounds selected from the group consisting of C_1

to C_{24} primary amines, C_1 to C_{24} secondary amines, methylene bisamines, ethylene bisamines and alkanolamines.

Claim 28 (Currently Amended): The composition of ~~claim 24~~ claim 1, wherein the fatty acid amides are one or more selected from palmitic acid amides, stearic acid amides, oleic acid amides, and N,N'- ethylenebisstearamide.

Claim 29 (Currently Amended): The composition of ~~claim 24~~ claim 1, wherein the fatty acid salts include one or more fatty acid salts of an ion selected from the group consisting of calcium, magnesium, zinc, and cadmium.

Claim 30 (Currently Amended): The composition of ~~claim 24~~ claim 1, wherein the hydrocarbon waxes include one or more selected from the group consisting of paraffin waxes, polyolefin waxes, oxidized polyolefin waxes, and microcrystalline waxes.

Claim 31 (Original): The composition of claim 1, wherein the high temperature engineering thermoplastic has a heat deflection temperature of at least 121°C.

Claim 32 (Original): An extrudable resin composition, comprising:

50 to 99.9 wt. % of a high temperature engineering thermoplastic consisting of one or more polyphenylene sulfides;

0.1 to 40 wt. % of a reinforcement component consisting of glass fiber;

0. 01 to 10 wt. % of an enhancing filler component consisting of titanium dioxide;

0.001 to 5 wt. % of a polymeric lubricant consisting of polytetrafluoroethylene; and

0.001 to 2 wt. % of an external lubricant selected from the group consisting of calcium stearate, zinc stearate, palmitic acid amides, stearic acid amides, oleic acid amides, and N,N'-ethylenebisstearamide, wherein the extrudable resin composition maintains its form and

function at temperatures up to about 232°C, and further wherein the high temperature engineering thermoplastic has a heat deflection temperature higher than about 121°C.

Claim 33 (Original): An extrudable resin composition, comprising:

50 to 99.9 wt. % of a high temperature engineering thermoplastic consisting of one or more polyphenylene sulfides;

15 to 25 wt. % of an enhancing filler component consisting of mineral oxide;

0 to 5 wt. % of a polymeric lubricant consisting of polytetrafluoroethylene; and

0.001 to 2 wt. % of an external lubricant selected from the group consisting of calcium stearate, zinc stearate, palmitic acid amides, stearic acid amides, oleic acid amides, and N,N'-ethylenebisstearamide, wherein the extrudable resin composition maintains its form and function at temperatures up to about 232°C, and further wherein the high temperature engineering thermoplastic has a heat deflection temperature higher than about 121°C.

Claim 34 (Original): The composition of claim 1, wherein the resin is extruded into a liner for a tubular.

Claim 35 (Currently Amended): [[In a]] A method of extruding an extrudable resin composition in an extruder, the improvement comprising:

compounding an extrudable resin composition comprising a high temperature engineering thermoplastic with an external lubricant component and one or more additives selected from the group consisting of a reinforcement component, a polymeric material, an enhancing filler component, and a polymeric lubricant component~~, and an external lubricant component~~, wherein the additives are uniformly dispersed within the high temperature engineering thermoplastic; and wherein the high temperature engineering thermoplastic comprises one or more selected from the group consisting of polyarylketones, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), polyolefins, and polyarylene sulfides; and the external lubricant component is one or more selected from the

group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes; and

feeding the extrudable resin composition to an extruder.

Claim 36 (Original): The method of claim 35, wherein the polymeric material is selected from the group consisting of high temperature engineering thermoplastics, natural and synthetic rubbers, plastics, and silicon-based polymers.

Claim 37 (Original): The method of claim 35, further comprising forming the extrudable resin composition into substantially cylindrical pellets before feeding the extrudable resin composition to an extruder, wherein the extruder has a vacuum sizer to form a substantially cylindrical liner, and further wherein the pellets have a diameter between about 1/16" to 1/4" and a length between about 1/16" to 1/4".

Claim 38 (Original): The method of claim 37, wherein the cylindrical liner is between about 20 to 100 feet in length.

Claim 39 (Original): The method of claim 38, wherein the cylindrical liner withstands hoop stress of between about 100 to 6,000 psi.

Claim 40 (Original): A high temperature liner produced according to the method of claim 35.

Claim 41 (Original): A method of transporting oil or gas in downhole applications, comprising moving the oil or gas through a line pipe, flow line, and transportation line, comprising the high temperature liner of claim 40.

Claim 42 (Original): A method of transporting oil or gas in downhole applications, comprising moving the oil or gas through a line pipe, flow line, and transportation line, comprising a high temperature liner produced according to the method of claim 35.

Claim 43 (Currently Amended): A liner, comprising a tube having a first end, a second end, and a tube wall,

wherein the tube wall extends between the first end and the second end, is substantially cylindrical, and has an outer surface;

the outer surface is smooth or non-smooth; and

the tube is made of a resin composition of high temperature engineering thermoplastic compounded with an external lubricant and one or more of a reinforcement component, an enhancing filler component, and a polymeric lubricant, ~~and an external lubricant,~~ wherein the composition is thermally stable at a temperature of up to about 427°C, and

wherein the high temperature engineering thermoplastic is one or more selected from the group consisting of polyarylketones, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), polyolefins, and polyarylene sulfides; and the external lubricant is one or more selected from the group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes.

Claim 44 (Original): The liner of claim 43, further including a plurality of disruption members attached to the outer surface of the tube wall, said disruption members creating the non-smooth outer surface, wherein the plurality of disruption members is made of the resin composition.

Claim 45 (Original): The liner of claim 44, wherein each of the disruption members is a tab including a tab wall.

Claim 46 (Original): The liner of claim 45, wherein a joint formed by the tab wall and the tube wall defines an acute angle with respect to the tube wall.

Claim 47 (Original): The liner of claim 46, wherein the acute angle is between about 30 and 60 degrees.

Claim 48 (Original): The liner of claim 47, wherein each tab is attached to the tube wall by sonic welding.

Claim 49 (Original): The liner of claim 44, wherein each of the disruption members is a rib including opposing rib walls.

Claim 50 (Original): The liner of claim 49, wherein each rib extends longitudinally of the tube wall.

Claim 51 (Original): The liner of claim 50, wherein a joint formed by each opposing wall of the rib and the tube wall defines an acute angle with respect to the tube wall.

Claim 52 (Original): The liner of claim 51, wherein the acute angle is between about 30 and 60 degrees.

Claim 53 (Original): The liner of claim 52, wherein each rib includes at least one passageway therethrough.

Claim 54 (Original): The liner of claim 53, wherein the at least one passageway is a rib cut defined in the rib.

Claim 55 (Original): The liner of claim 54, wherein the rib cut defines an acute angle with respect to the longitudinal axis of the liner.

Claim 56 (Original): The liner of claim 55, wherein the rib cut is between about 1/64" to 2".

Claim 57 (Original): The liner of claim 44, wherein each of the disruption members is a groove anchor member comprising a groove having groove walls on either side of the groove, said groove walls being higher than the surface of the liner, said groove anchor member formed by a heat mechanism which melts the liner surface to create the groove anchor member, said heat mechanism selected from the group consisting of knurlers, solder irons, and lasers, and further wherein the groove anchor member forms a surface pattern on the longitudinal axis of the liner.

Claim 58 (Currently Amended): A method of using a tubular, comprising the steps of:

providing a liner having a plurality of disruption members on an outer surface thereof;

installing the liner within the tubular; and

filling an annular gap between the tubular and the liner with a filler material, wherein the filler material flows around the plurality of disruption members and adheres to the plurality of disruption members to aid in preventing the liner from displacing longitudinally from within the tubular, wherein the liner and the plurality of disruption members are made of a resin composition of high temperature engineering thermoplastic compounded with an external lubricant and one or more of a reinforcement component, an enhancing filler component, and a polymeric lubricant, ~~and an external lubricant,~~ wherein the composition is thermally stable at a temperature of up to about 427°C, and

wherein the high temperature engineering thermoplastic is one or more selected from the group consisting of polyarylketones, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), polyolefins, and polyarylene sulfides; and the external lubricant is one or more selected from the group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes.

Claim 59 (Original): The method of claim 58, wherein the annular gap is between about 10 to 80 mils.

Claim 60 (Original): The method of claim 58, wherein the annular gap is between about 20 to 50 mils.

Claim 61 (Original): The method of claim 58, wherein the filler material is selected from the group consisting of grout, cement, polymers or blow molding compounds.

Claim 62 (Original): The method of claim 61, wherein each of the disruption members is a tab including a tab wall.

Claim 63 (Original): The method of claim 62, wherein a joint formed by each tab wall and the tube wall defines an acute angle with respect to the tube wall.

Claim 64 (Original): The method of claim 63, wherein the acute angle is between about 30 and 60 degrees.

Claim 65 (Original): The method of claim 64, wherein each tab is attached to the tube wall by a method selected from the group consisting of sonic welding and adhesive.

Claim 66 (Original): The method of claim 61, wherein each of the disruption members is a rib including opposing rib walls.

Claim 67 (Original): The method of claim 66, wherein each rib extends along the longitudinal axis of the tube wall.

Claim 68 (Original): The method of claim 67, wherein a joint formed by each rib wall and the tube wall defines an acute angle with respect to the tube wall.

Claim 69 (Original): The method of claim 68, wherein the acute angle is between about 30 and 60 degrees.

Claim 70 (Original): The method of claim 69, wherein each rib includes at least one passageway therethrough.

Claim 71 (Original): The method of claim 70, wherein the at least one passageway is a rib cut defined in the rib.

Claim 72 (Original): The method of claim 71, wherein the rib cut defines an acute angle with respect to the longitudinal axis of the liner.

Claim 73 (Original): The method of claim 72, wherein the rib cut is between about 1/64" to 2".

Claim 74 (Original): The method of claim 61, wherein each of the disruption members is a groove anchor member, said groove anchor member created by using a heat mechanism.

Claim 75 (Original): The method of claim 74, wherein the heat mechanism is selected from the group consisting of solder irons and lasers.

Claim 76 (Original): The method of claim 58, further comprising transporting oil or gas in downhole applications, comprising moving the oil or gas through a line pipe, flow line, and transportation line, comprising a high temperature liner produced according to the method of claim 35.

Claim 77 (Currently Amended): A method of transporting oil or gas in downhole applications, comprising:

providing a tubular comprised of a tubular and a liner, wherein the liner is comprised of a high temperature engineering thermoplastic compounded with an external lubricant and one or more of a reinforcement component, an enhancing filler component, and a polymeric lubricant, ~~and an external lubricant,~~ and further wherein the extrudable resin composition is thermally stable at temperatures of up to about 427°C, wherein the high temperature engineering thermoplastic is one or more selected from the group consisting of polyarylketones, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), polyolefins, and polyarylene sulfides; and the external lubricant is one or more selected from the group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes; and

moving the oil or gas through a line pipe, flow line, and transportation line comprised of the liner.

Claim 78 (Currently Amended): A method of transmitting or storing corrosive fluids in corrosive applications, comprising:

providing a tubular comprised of a tubular and a liner, wherein the liner is comprised of a high temperature engineering thermoplastic compounded with an external lubricant and one or more of a reinforcement component, an enhancing filler component, and a polymeric lubricant, ~~and an external lubricant,~~ and further wherein the extrudable resin composition is thermally stable at temperatures of up to about 427°C,wherein the high temperature engineering thermoplastic is one or more selected from the group consisting of polyarylketones, chemical resistant polysulfones (PSU), polyphenyl sulfones (PPSu), polyether sulfones (PES), polyolefins, and polyarylene sulfides; and the external lubricant is one or more selected from the group consisting of fatty acids and their corresponding amides, esters, and salts; organic phosphate esters; and hydrocarbon waxes; and

transmitting, storing, and/or thermally insulating the corrosive fluids in the liner;

wherein the corrosive applications include piping, said piping selected from the group consisting of wastewater treatment, chemical plants, slurry pipes, paper mills, agricultural/biological facilities, and electric power plants.